

Glen Canyon Adaptive Management Work Group (AMWG)

DRAFT

**Minutes of July 21-22, 1998 Meeting
Phoenix, Arizona**

Presiding: Stephen Magnussen, USBR (Chairperson)

Recorder: Serena Mankiller, GCMRC Secretary

7/21/98: Convened: 9:33 a.m. **Adjourned:** 3:58 p.m.

7/22/98: Convened: 8:05 a.m. **Adjourned:** 3:13 p.m.

Welcome and Introductions

Stephen Magnussen introduced himself as the Secretary's Designee and Chairperson for this committee. He welcomed the committee members, member alternates and visitors to the third Adaptive Management Work Group meeting.

Roll Call

The members introduced themselves and identified whether they were an appointed member, a member awaiting official appointment, or an alternate. A quorum was present on both days and the Chairperson declared the meeting to be official. The Chairperson stated that alternates are authorized to vote and speak on issues as if they were a member. Two representatives are awaiting official member status: Tom Latousek of American Rivers, and Leslie James of CREDA. Their appointment letters are awaiting signature by the Secretary and for this meeting they may serve as alternates with the same voting and speaking rights.

Review/Approval of Agenda: The Chairperson reviewed the agenda. No additions were made.

Recommendation: On motion duly made, seconded and carried, the agenda was approved.

ADMINISTRATIVE BUSINESS

The Chairperson wished David Garrett (GCMRC), who is currently on medical leave, a speedy recovery. Barry Gold has been named Acting Chief of GCMRC.

The new web site address (Attachment 1) for the GCMRC AMWG/TWG is: http://130.118.161.89/amwg_new. It has current meeting information, working drafts and ad hoc group information. The UC USBR web site <http://www.uc.usbr.gov/amp> has final documents from the AMWG/TWG meetings.

Approval of January Meeting Minutes: (Attachment 2) Minutes of January 15-16, 1998 were reviewed. They were not distributed within the 60-day time limitation.

Clarification was requested under the topic: "November 1997 High Flows" (regarding the KAS incidental take) wherein it states: "The incidental take level was in excess of 10% of the populated habitat, but remained well below 1% of the overall population." Barry Gold stated

that a later post-flood survey indicated approximately 3% take of the populated habitat occurred. The committee requested a technical correction be made to the minutes to reflect this post-flood data.

Recommendations: Barry Gold will clarify the KAS populated habitat take and inform the meeting recorder, who will make a technical correction to the minutes in the form of a footnote. On motion duly made, seconded and carried, the minutes were approved with the aforementioned technical revision. Future minutes will be distributed within the 60-day time limitation.

A question was asked about how to obtain the GCMRC FY99 Request for Proposals document (referenced in the minutes). It is currently being reviewed by the UC USBR Contracting Office. When it goes public on July 31, 1998, the AMWG, the TWG, and several hundred persons and/or organizations on the GCMRC RFP data base will receive notification of its availability on web sites: <http://130.118.161.89/gcmrc/gcmrc.html> or <http://www.uc.usbr.gov/acq>.

Approval of TWG Operating Procedure Change: (Attachment 3) The Chairperson reviewed a proposed addition to the TWG Operating Procedures. The proposal is to assure that the TWG has opportunity to review Science Advisory Board (yet to be established) technical advice and scientific review information when submitted to the AMWG. This will be accomplished by the TWG being distributed a copy at the same time the information is being submitted to the AMWG. A minor revision suggested at the TWG meeting held on July 20, 1998, was noted and accepted.

Recommendation: On motion duly made, seconded and carried, the TWG review of Science Advisory Board technical advice and scientific review information submitted to the AMWG addition (as revised) was made to the TWG Operating Procedures.

Approval of AMWG Charter Renewal: The Chairperson reviewed a TWG position paper on the biennial renewal of the AMWG Charter. It also included a proposed revision to create cost efficiencies regarding the required public notification procedure of future AMWG and TWG meetings which are published in newspapers in seven states. The proposal suggests that news releases rather than paid advertising be approved by the AMWG as its new public notice publishing procedure. This is in addition to the FRN publishing requirement.

Recommendation: On motion duly made, seconded and carried, the AMWG approved the recommendation to the Secretary to charter the (AMWG) organization for another two years. On second motion duly made, seconded and carried, the AMWG approved the proposed public notification procedure as outlined in the TWG position paper be changed to news releases submitted to the newspapers rather than paid advertising, and that the AMWG Charter language be revised to reflect said procedure change.

Electronic Form Handouts: The Chairperson stated that in order to prepare complete

meeting materials for members and for submission to the Library of Congress, the minutes must include all attachments and presentation materials. The proposal requires electronic copies of information presented and handouts distributed during the AMWG meetings be provided by the presenter to the meeting recorder. Information or presentation materials may be submitted in any format: disk/e-mail/other electronic format for posting on the web site(s). The following was also suggested: (1) official members wish to continue receiving mailed, hard copies of the full packet of meeting materials in addition to their availability on the web site; (2) attachments (in the 30-day mailing package) should be numbered according to the topic placement on the agenda; (3) official members (especially Tribes) not on the internet continue to receive hard copies of all information; (4) when new or updated items are posted on the GCMRC AMWG/TWG or UC USBR/AMP web sites, an e-mail notification or letter is distributed to the official members, and interested parties on the courtesy copy lists will also be sent the e-mails; (5) official members will continue to provide AMWG meeting materials information to their staff, or refer them to the web sites to download the documents.

Recommendation: The AMWG recommended that the proposal for electronic format of presentation materials and handouts, and the abovementioned meeting materials distribution procedures be implemented or continued, effective immediately.

TECHNICAL WORK GROUP

Overview of Activities: Robert Winfree (Chairperson, TWG) reviewed the overall tasks assigned by the AMWG to the TWG at the January, 1998 meeting. Status reports were presented by representatives from the ad hoc groups.

Approve Management Objectives and Information Needs: (Attachment 5; 6/19/98 mailing)

Management Objectives: are defined as a desired future resource conditions considered obtainable within the modified low fluctuating flow alternative prescribed by the ROD. They are fairly timeless rarely deleted unless there is a major change in the program's direction. The Management Objectives were not prioritized in the final ranking process.

Information Needs: describe monitoring, research or information management requirements to evaluate the effects of the Secretary's actions and refine management approaches. During the annual review process, it will be determined if an information need has been accomplished and should drop off the list. New needs are added as research or monitoring identifies new questions that need to be addressed. The Information Needs were prioritized.

Review Process: Robert Winfree reported that the TWG established an ad hoc group to meet frequently in order to accomplish the task in a more timely and efficient manner than a large monthly meeting. The entire TWG volunteered for the ad hoc group, but all members were unable to attend every meeting. Updated information and requests for input was regularly communicated to the TWG, and monthly status reports given at TWG meetings. Management

Objectives and Information Needs originally established by the Transition Work Group (dated July 2, 1996) were reviewed and revised. Each requested information need was reviewed in detail, including appropriateness according to the law, dam operations and the AMWG's charge. At the end of the review process, GCMRC had 165 projects to work on, and budget and time restrictions. To better enable the GCMRC to design its annual and long-term programs, it required guidance from the stakeholders regarding which projects to work on first, and which could be staggered into upcoming budget years.

Prioritization Process: The final process was to establish information need priorities for program planning. The Salt River Project had utilized an effective approach to priority setting, and that process was adopted. Fourteen of the ad hoc group members or alternates attended a meeting to rank the information needs. Each participant could vote twice: once for their organization's highest priorities across all resource classes, and once for the highest 30% of their priorities within each separate class. This two-step prioritization process established which projects are the most urgent and which are of long-term importance.

Discussion about the process by the TWG and AMWG included:

1. More TWG members needed to be involved in all aspects of the review process
2. The compressed time frame for this task made it more difficult to accomplish
3. Important input was submitted too late to be included in this year's process
4. It may be advisable to have the SAB or NRC review the process or product

The review process will be conducted annually as the GCMRC completes its fiscal year end studies and information needs diminish. This will allow information needs not submitted in time one year to be included in the following year's process. The AMWG felt this process falls within its purview and external committee review is currently not required.

Lake Powell: The Chairperson requested that the AMWG focus on the appropriateness and approval of Lake Powell Management Objectives on July 21, 1998, and discuss funding issues on July 22, 1998.

Recommendation: The TWG respectfully requested that the AMWG approve the following proposal: that the Adaptive Management Work Group accept the set of Management Objectives (revision date June 10, 1998), task the Technical Work Group to review and update the Management Objectives annually, and that the Technical Work Group also work with the Grand Canyon Monitoring and Research Center and with the Science Advisory Board to make sure that the Information Needs are properly integrated into a scientifically-balanced program and that that program is reviewed by the Technical Work Group and brought back to the Adaptive Management Work Group for approval before it is implemented. On motion duly made, seconded and carried by a two-thirds vote, the AMWG approved the aforementioned proposal.

It is noted that the above motion includes Lake Powell Management Objectives unless

modified by the AMWG at its meeting on July 22, 1998, after review and discussion of the Lake Powell 5-year Plan and budget issues.

It is noted that a motion was made and seconded to amend the original motion: "to only vote on those parts of the Management Objectives that do not include Lake Powell." Said motion failed to carry.

Approval of Science Advisory Board Formation: Barry Gold stated that the FEIS calls for the Secretary of the Interior to establish IRPs. A TWG SAB Ad hoc Group was formed to gather information for TWG review and recommendation to the AMWG. Dr. Gold summarized the SAB Final Discussion Paper (Attachment 7; 6/19/98 mailing). The SAB will be established as an AMWG subcommittee and is required to comply with all applicable FACA requirements. It will meet at least three times per year or as needed. The USBR will provide FACA support. GCMRC will provide administrative support (travel expenses, report production). Discussion ensued regarding the SAB's independence, budgetary control, and need for a single point-of-contact reporting structure to ensure control of and efficient communication and completion of work requests. If there is a duplication of effort between the SAB and the NRC Review Committee activities, the NRC contract will be critically reviewed before renewal.

The AMWG reviews and recommends adoption of the SAB's budget, which is estimated at \$50,000 for its first year of operations. It was clarified that the Secretary's Designee represents the Secretary and for the purposes of the AMWG is considered to be the Secretary. The AMWG is a recommending body to the Secretary through the Secretary's Designee, who is Stephen Magnussen. Because the SAB is a subcommittee of the AMWG, it should report to the Secretary's Designee through the AMWG. The Secretary's Designee will receive advice from the AMWG.

The RFP has been sent to the SLC Contracting Office and it is planned to be released to the public by July 31, 1998. It is planned to convene the IRP by the end of October, provide the TWG with recommendations for a peer review panel in November, recommendations for appointments to the SAB panel to the Secretary by December, and have the panel in place by January, 1999. The AMWG requested that the SAB RFP reflect that there is a single individual responsible for giving it direction and assignments. Requests may be submitted from various interests and entities, and this will be addressed when operating procedures are developed after the SAB is formed.

Recommendation: On motion duly made, seconded and carried, the SAB RFP language shall be revised to reflect that it will be a subcommittee of the AMWG and recommendations will be transmitted to the Secretary's Designee through the AMWG.

Flash Board Proposal (GCD Spillway Gate Extensions): (Attachment 3; 6/19/98 mailing)
Bruce Moore stated that the TWG was tasked with analyzing the implications of not permanently installing the flash boards. Analysis by the TWG and position papers developed

by groups and circulated to the TWG indicate that currently there is insufficient data and information to support permanent installation of the flash boards. The TWG recommends that the AMWG advise the Secretary to postpone installation of 4.5 foot extensions on both sets of spillway gates at GCD. During this indefinite period, operation of the dam shall be in accordance with the AOP and shall not include reservation of storage to compensate for space that would have been created by the extensions. A position paper, draft Federal Register Notice and a white paper have been prepared. The TWG recommended that the document contain some recognition of the work done in conjunction with BHBFs and other GCMRC studies; (2) the language be modified regarding postponement pursuant to the TWG discussion on July 20, 1998; (3) continue reporting on operations without the flash boards; (4) report back as data becomes available about keeping the extensions on or off.

Recommendation: On motion duly made, seconded and carried, the TWG shall:

1. Continue to give status reports to the AMWG on progress of operations without flash boards, including how this decision of not installing the flash boards:
 - a. impacts frequency of BHBFs;
 - b. affects the 1:100 frequency of floods;
 - c. affects spill avoidance criteria that Reclamation uses.
2. Report back to the AMWG and report as data becomes available regarding:
 - a. installing the flash boards;
 - b. not installing the flash boards.

In addition, the Federal Register Notice and the white paper shall be modified as follows:

- A. To include the TWG tasks enumerated above (#1 and #2 et. al.)
- B. To include some recognition of the work that has been done in conjunction with BHBFs and other GCMRC studies.
- C. The word "indefinitely" shall be deleted from the official TWG recommendation. The modified sentence shall now read: "Based upon the analysis and comments received from TWG members, the TWG recommends that the AMWG advise the Secretary of the Interior to postpone permanent installation of the 4.5 foot spillway gate extensions."

State of the Resources Report (SCORE Report) Outline: Mike Liszewski, GCMRC Information Technology Program Manager, reported that a pilot effort is underway based on the TWG's request for the SCORE Report, entitled "SCORE 98." He gave an electronic presentation of the report to the AMWG. The goal of the report is to make it as useful as possible to the decision-making process of GCD operations. It will be utilized as an information delivery tool for the AMWG, the TWG and upon completion, the public. This ongoing outreach project will be updated as information is received in from researchers, and a draft is planned to be ready by late September 1998. It will be accessible on the GCMRC web

site, in written form, and will include a ten-page Executive Summary. The GCMRC is working on linking some of the final reports due in at the end of September so the data can be analyzed immediately for an evaluation by December to determine if the resource is ready for either a potential controlled flood between January and July or another type of flow release designed to benefit downstream resources.

BEACH/HABITAT-BUILDING FLOW ISSUES REPORTS

Spring 1998 BHBF Compliance: Tony Morton reported that the USBR recommended compliance activities be ceased for a 1998 BHBF when the May 1998 forecast indicated that the hydrologic criteria would not be met. The TWG concurred and also recommended that resources be refocused on preparation for a programmatic approach to future BHBF compliance.

BHBF Above 45,000 cfs & Powerplant Fluctuations: (Attachment 8; 6/19/98 mailing) Tom Moody gave a status report on the proposal to develop a research plan to analyze the response of natural resources below GCD to a BHBF greater than 45,000 cfs and fluctuations during periods of high powerplant releases. The TWG had formally requested GCMRC to prepare a design and assessment on a set of flows above 45,000 cfs and load following that could better achieve the objectives of a BHBF, include a research plan to accompany those test flows, and an evaluation of the impacts of the test flows proposed. At its meeting on July 20, 1998, the TWG discussed issues and acceptable parameters regarding broadening the range of flows, ramping rates, fluctuating flows, floods greater than 45,000 cfs and load/no load following. The TWG was to re-review the proposal regarding GCMRC's assignment (contained in the above referenced attachment) so it may be verified at the TWG meeting on July 23, 1998, before GCMRC begins work. The TWG will review the GCMRC reports and prepare a recommendation for the AMWG at its January 1999 meeting.

BHBF Resource Trigger Criteria: (Attachment 16; 6/19/98 mailing) Barry Gold presented background information and reviewed the document. The action/no action Translation Table (Attachment 4) for a May/June sample analysis includes a list of management objectives and is categorized resource by resource. At the TWG meeting on July 20, 1998, it was requested that one final draft be prepared which addresses remaining concerns of stakeholders, and it is planned to have it finalized by August 1998.

Robert Winfree stated that the TWG is proposing to finalize the process shortly, implement the protocol this fall and report back to the AMWG in January 1999 an analysis for WY99 hydrologic season how the resource criteria rate, in a given month between January and July. The TWG would recommend for or against a flood based on the resource criteria analysis. The TWG's recommendation is to continue this work and report to the AMWG in January 1999.

The TWG's thinking has changed recently. At the last meeting the TWG said that an announcement of the projected water conditions from the USBR would be made and if the hydrologic criteria were met the Center would perform an analysis on the resource condition

based on the resource criteria established. A decision can then be made by the Secretary's designee (probably the USBR) for or against a flood based on resource criteria. In further considering the process, the TWG realized that they will have most of this data together by late fall and should move our timetable up so a decision can be made by January 1, 1999.

A question was asked if resource impacts were considered if the hydrologic criteria is met in months other than January through July, especially if there is a high sediment input from the LCR or Paria. December is possible as a result of very high, early snowpack but this is unusual, forecasts in December cannot be accurately forecast, and we do not have authority to spill in other months. Historically the summer months might be above 1.5 MAF, but a BHBF would have already been triggered in such a year. The issue was previously addressed in an agency cooperation meeting, and it was ultimately determined that spring is the best time. Barry Gold offered that over time as we develop monitoring data with the conceptual model, we can re-visit the question.

BHMF: Randy Peterson encouraged the AMWG to charge the TWG to consider running a BHMF in late summer or fall up to powerplant capacity to take advantage of sediment inputs from the Paria or LCR. Barry Gold stated that when we wanted to run August/September BHMF for this reason, it took until October to obtain compliance. A suggestion was made to consider all resources, not just sediment conservation. The evaluation would include doing no harm to juvenile Humpback chub.

Recommendation: The AMWG charged the TWG with finalizing and implementing the BHBF Resource Criteria, including expanding the resource criteria to include BHMFs up to powerplant capacity in other months. The TWG shall report back to the AMWG in January 1999.

Kanab Ambersnail (Second Population): Dennis Kubly (AGFD) reported that the last two BO's that have addressed establishment of a second wild population of KAS in conjunction with BHBFs. AGFD has worked on a better understanding of KAS biology and ecology for four years. During the last two years they have been evaluating 83 sites in the Grand Canyon region (sites were not restricted to GCNP), partially because the KAS Recovery Program identifies the need for 10 additional populations, some of which can be discovered populations. None of the 83 sites has a population, making it necessary to translocate snails out of the parent population at Vaseys Paradise. On July 6, 1998, the NPS released an EA, some comments have come back, and the deadline for comments is August 5, 1998. Twelve sites evaluated in the EA were in GCNP. The EA has two alternatives: (1) status quo; (2) translocate and attempt to establish a second wild population. A Biological Assessment on the PA will be generated which will give specifics about the KAS and how translocation will be accomplished. Final criteria have not yet been established on determining whether or not a second population is successful. A river trip will be conducted August 3 or 4, 1998 which will go to the preferred sites for reestablishment to conduct topographic surveys and establish the exact location where the KAS will be translocated. Later in August, the translocation will be done. He identified the three sites, which are not the most optimum biologically because within the NPS's

management requirements there are other conditions that apply, but an earlier process determined them to be the most preferred sites. The new establishments will be fully protected under the ESA and because they are in a national park. One hundred individuals will be transferred, and it is hoped that sufficient survivorship for reproduction will occur next spring to establish at least one wild population. At one site only, the snails will be impacted from a 45,000 up to a 120,000 cfs flow (if they eventually move themselves to that area after translocation). Monitoring will occur in September and in the spring to determine survivorship at that stage. Subsequent monitoring and (if necessary) augmentation could be conducted and the information gathered may assist in compliance for future BHBFs. When questioned if the baseline could be increased, Mr. Kubly warned that the effects of dam flows are only one threat to the KAS population. Talus slope movement, predators, parasitism and high flows collectively may prove too much for survival. Increasing the baseline incrementally may cause a net effect considerably in excess of 10%.

Negative feedback was expressed because the tribes were not included as cooperating agencies on the EA. The AMWG was reminded that as sovereign nations, the tribes are afforded the opportunity to participate as cooperating agencies. NEPA regulations exist which specify that tribes are afforded cooperating agency status on NEPA documents. Rather than waiting until the public process, the tribes should be involved at the beginning because there may be unresolved issues that arise, they have a lot to contribute, and they can assist in the process. This needs to be taken into account for future compliance efforts under the adaptive management process. All tribal concerns are not covered under the PA. Tribes do not necessarily concur with a project because they have not responded within a pre-imposed 30-day timeframe. It may take 90 days and involve serious concerns about resources that may be impacted by a federal action. The federal agencies have a responsibility for government-to-government relationships and a legal trust responsibility. The absence of a tribe at a meeting does not stop the federal government's legal responsibility to that tribe, its trust assets and resources. The KAWG meetings are open to everyone, the tribes will be added to the mailing list if they are not on it, and minutes taken at the meetings can be requested.

Recommendation: The agency initiating the action will be responsible for ensuring initial and continuing involvement in these processes by the tribes and follow-up efforts including personal contact (telephone or meetings). The agencies need to develop their own relationships with the individual tribes because different levels of participation may be desired, varying by tribe. Tribal representatives will be included in ad hoc and working groups.

Tony Morton reported that the USBR requested clarification from the USFWS on language contained in the 1996 BHBF and the 1997 Fall Test Flow Biological Opinions about establishment of a second population of KAS prior to conducting another BHBF. The USFWS confirmed that the BO's require a second population of KAS be established prior to conducting another BHBF of 45,000 cfs or greater. It offered to work with the USBR and the KAWG to develop a definition of what a second population consists of, and the USFWS provided a draft definition in their response (Attachment 5, letter dated July 2, 1998) as follows:

"The establishment of a new wild population of the Kanab ambersnail can be considered successful when: 1) the population densities, fecundity, and recruitment are similar to those of the parent population at Vaseys Paradise; 2) habitat remains suitable while accommodating environmental uncertainties including changes in weather, food supply, predators, and other factors; and 3) the trend of population growth must be positive or at equilibrium with the available habitat for a certain period of time, perhaps (3) years."

The question was asked if we have data to support running a BHBF up to 45,000 cfs. Mr. Morton stated that the Regional BO for operation of the dam contains a requirement to not exceed incidental take of 10% of the KAS-occupied habitat in Grand Canyon. At the May 1998 TWG meeting, Larry Stevens (GCMRC) stated that a magnitude of 42,000 cfs would not exceed 10%. Clarification of the 10% baseline was requested. The habitat at Vaseys Paradise was used as a baseline at the time the 1995 BO was written. Federal agencies have the option to reinitiate consultation after the final BO, if the opinion cannot be implemented, or if incidental take will be exceeded, or if new information needs to be evaluated. The USBR may wish to evaluate that option and the USFWS will accept and review such a request. It was clarified that if another KAS populated habitat is established or enlarged, the 10% baseline established in 1995 is still in effect, but that additional habitat would be counted as total area towards the overall 10% take restriction. If new populated habitats are established in areas other than Vaseys Paradise, the incidental take at the Vaseys Paradise location from a BHBF could be increased above 10%, as long as 10% of total populated habitat, wherever it is located in Arizona, is not exceeded. As the square meter populated habitat area is increased, the baseline increases which is desirable for preservation of the species because it is 10% of more habitat. The group discussed the historical basis of the 10% baseline. The decision about the baseline was made by the best experts in the field. The agencies need to continue consultation on the definition of reestablishment.

He suggested that the TWG and AMWG consider recommending that the USBR, USFWS and members of the Compliance Team (referenced later in these minutes) continue to pursue compliance by December 31, 1998, for a WY99 BHBF given the situation with the KAS

Recommendation: The AMWG recommended that the Compliance Team continue to pursue work on establishing a second population of KAS, and confirm that compliance is in place for a WY99 BHBF up to a maximum of 42,000 cfs (should the hydrological and biological criteria support such a flow).

Approval Process for Future BHBF Flows: Tony Morton reported that the TWG asked the USBR to form a Compliance Team to establish a list of tasks and a schedule to be accomplished by December 1998 for a potential BHBF in WY99. The Team met on June 23, 1998, and identified a list of tasks that require completion prior to running a BHBF including NEPA, ESA, NHPA, research and monitoring permitting, and a research and monitoring plan. Compliance with NEPA, ESA and NHPA would all proceed on a concurrent basis beginning immediately following this AMWG meeting, and ending on December 31, 1998. The focus

was on the 135 days required to complete the USFWS' BO following receipt of the BA. This requires USBR to provide its BA by mid-August 1998, and currently this timeframe cannot be met. The Team discussed ways in which it could assist the USFWS if the timeframe were compressed to 45 or 60 days. The 45-day schedule would benefit USBR's BA preparation; the 60-day would benefit USFWS' BO preparation. The Compliance Team recommended (regardless of which schedule is chosen) a process to produce a "Working Draft BA." Also a workshop be held consisting of aquatic and terrestrial scientists (selected by the TWG and GCMRC), to assist in producing and completing the best possible BA and reduce USFWS efforts in writing its BO. The USFWS will chair a Consultation Team to meet monthly during the process to facilitate communication and track the schedule of work products in order to assist in producing a BO within 45 to 60 days after receiving the final BA from USBR.

The Compliance Team was tasked to define a proposed action for a WY99 event. Initially it was a flow between 45,000-60,000 cfs for 2-4 days between January 1 and July 31, 1999. It had originally been asked to consider fluctuating flows above powerplant capacity in addition to a BHBF. The Team decided that including fluctuations would be poor experimental design, and, due to the lack of an environmental baseline for comparison and having more than one variable involved, it would be difficult to establish cause-and-effect. For the same reasons, they decided not to include low flow studies for endangered fish and the temperature control device, which would require a more comprehensive programmatic document. They decided to stay with a programmatic document for BHBFs and not a program of experimental flows from GCD. It may be advantageous to run a BHBF, collect the data, and incorporate fluctuating flows at the next water year which presents the opportunity. The TWG and the AMWG should determine if the proposed action is encompassing enough or if a programmatic approach with a greater range of potential flows should be pursued. The TWG will discuss further on July 23, 1998, what the proposed action and range of flows should be, and the Team will start working on compliance for that.

Recommendation: The AMWG recommended that the Compliance Team shall evaluate a program of BHBF flows somewhere between powerplant capacity and 90,000 cfs, between 1-14 days, including fluctuating flows following, evaluate effects on erosion, from January 1 to July 31 annually, and the possibility of running higher flows during the August-November timeframe associated with tributary input.

BASIN HYDROLOGY & 1998 AOP PROCESS: (Attachment 6) Randy Peterson reviewed 1998 hydrology and projections for next year. A 1998 BHBF was not triggered due to a low forecast error and nearly normal runoff (190% of normal) due to a dry, warm late April melting low elevation snowpack and normal May temperatures with almost no precipitation. Lake Powell Inflows for most of the spring were a controllable 30,000-50,000 cfs range, Lake Powell finished the season three feet from full at its highest point, and elevation is the highest it has been in 10 years. In April the risk of spill or uncontrolled release was nearly zero, so releases were lowered to adhere to the legal mandates of the 1968 Act. Due to the high water elevation and an increased chance of heavy snowpack early in the season, there is a 33% chance of a BHBF being triggered next January or February (last year was 10-15%). Releases may average

12,000-20,000 cfs (about 10.7 MAF). There will probably be no equalization releases next year, with about a 25% chance of an 8.23 MAF release next year. Plans should be in place for an analysis of a potential BHBF (at whatever flow level is allowed by compliance), and plans for low flows for an 8.23 release during the summer months, as both are equally likely. Draw downs this year were a few feet deeper than normal, and that approach is planned for next year. The AOP/Annual Report is complete and expected to be signed and released by the Secretary's office in late October. It contains the surplus determination to the Lower Basin and Mexico resulting from current full reservoir conditions.

CONCEPTUAL MODEL Barry Gold gave a status report on the conceptual model development. In January 1998, GCMRC held a scoping workshop consisting of 8-10 modelers and collected data. The conceptual modelers participated in a river trip in April 1998 to increase their understanding of the system. In May 1998, 45 scientists and managers met for the first modeling workshop to develop the initial model structure and parameter estimates. The modelers later completed the initial model development, and took parameter estimates and scientific data. They are now validating various aspects of the model. An aquatic resources subgroup met in July, a physical scientist group will meet in August, and a second, smaller modeling workshop is planned for October 1998. The October workshop will focus on validating the model, training the scientists in its use by reviewing and running various dam operation scenarios. This activity is known as "policy screening exercises." The modelers feel that in the absence of problems with the model, they will finish the contract ahead of schedule. Dr. Gold emphasized that this is not an overly detailed, engineering-type model which gives very precise, predictive results. He wanted the AMWG to be aware and informed that when the model scenarios are run, good solid information will be generated, but also some "white noise" will probably be verbalized by the modelers to the AMWG if the models show negative impacts to the system. If negative impacts are showing up, the scientific process will move to the next stages to validate the results and answer questions and assumptions, in order to improve and learn from the management action and its accompanying experimental design. After the predictions come out, there is still a lot of work to do to fine tune the experiment and verify the results. The model has good graphical interfaces for the scientists to use, and they feel it is a valuable tool to test their assumptions. Dr. Gold identified a need for better data on aquatic productivity, specifically phytoplankton and zooplankton which comes into the system from Lake Powell. It is expected that the information will assist the TWG in its evaluation of the annual plans and strategic plan to verify if the right components are being measured, because the model integrates parameters and assists with measurable components, which are the most important elements to monitor in the system.

LAKE POWELL Barry Gold stated that at the September 9, 1997 meeting, the TWG recommended and the AMWG charged GCMRC to develop a long-term monitoring and research plan for Lake Powell water quality. Subsequently, management objectives and information needs were developed and separated into downstream/upstream information needs. Feedback on the five-year plan indicates that it should have been shown more clearly about how the monitoring is directed to meet both the downstream and upstream information needs.

Assessment: Susan Hueftle (GCMRC) gave a technical presentation on the task assigned to assess (not quantify) water quality of Lake Powell and tailwaters below the dam. Results were restricted to water quality attributes associated with GCD operations for existing information. The focus was on 30 years of temperature, conductivity and dissolved oxygen because of the accuracy and availability of this electronic historical data. The external limnologist review of the assessment and results included: pulse discharges can have a significantly different impact than an averaged flow by penetrating and vertically mixing at greater depths and allows the ability to influence what is being discharged; special dam operations impact lake and tailwater quality; periods of low dissolved oxygen buildup due to water stagnation below penstocks, if not flushed out in time, in other systems has led to poisoning of downstream aquatic foodbase, fish kills and turbine damage at other dams. Anoxic conditions reaching the penstock levels have not yet occurred at GCD but is a future threat. In 1995 in the Lees Ferry Reach showed dam discharges and annual upwelling cycles influence the composition of the phytobenthic community (less cladophora foodbase). Conclusions based on the assessment include: (1) that the climate and inflow hydrology are the foundation Lake Powell limnology, but dam operations influence the routing and discharge of various levels of lake water; (2) some water quality issues such as meromixis, hypoxia and anoxia may pose future problems; and (3) that lake and tailwater monitoring continue to provide information to the AMP. The 30-year historical animation is available on the AMWG/TWG web site or: www.usbr.gov/gces/lpani.html.

Approval of 5-year Plan: (Attachment 17; 6/19/98 mailing) Bill Vernieu (GCMRC) reported that the five-year plan was developed as a result of the directive from the AMWG last September. The objective of the GCMRC water quality monitoring program was to monitor effects of dam operations on key water quality parameters and aquatic ecosystem resources within Lake Powell and downstream of GCD. The five-year plan addresses management objectives and information needs developed for Lake Powell, and the separate downstream management objectives and information needs. The program is designed to monitor water quality changes from dam discharges which feed the downstream ecosystem. He reviewed the management objectives and how they will be addressed by GCMRC work, other agency work, the conceptual model and information synthesis. Except for GCMRC work, all work is currently funded outside of the AMP, and meets some of the specific information needs of the management objectives for the AMP. A timetable for components of this plan was reviewed. Discussion by the group included concerns about the management objectives' applicability, study and relationships to dam operations, GCPA requirements, appropriateness of some studies to the AMP, and budget issues.

Recommendation: On first motion duly made, seconded and carried, the AMWG directed the TWG to assess the Management Objectives and Information Needs and the five-year plan as outlined and report back a recommendation delineating clearly downstream effects and other effects and tied to that make a recommendation as to an appropriate budget for the program and that the analysis also include the institutional and financial relationships to get the upstream work done. Clarification of motion: the total information need will still be retained in the plan, but a budget distinction will be made about which work project items will be funded by the

AMP and which will be funded by others. When the TWG has completed its task, the AMWG is willing to approve that five-year plan (beginning with FY2000). On a second motion duly made, seconded and carried, the AMWG delegated this action to the TWG, and the TWG Chairman will communicate back to Reclamation the results of the effort to carry out the first motion.

GLEN CANYON DAM TEMPERATURE CONTROL DEVICE (Dave Trueman, USBR)

Draft EA: The Draft EA (dated June 22, 1998) was previously distributed to the TWG for review. Some controversy exists on whether to pursue an EA or an EIS. The EA will assess potential impacts, and the effort is to avoid adverse impacts. Known potential adverse impacts are to rainbow trout, and non-native fish competition with the nine known aggregations of endangered Humpback chub. Water temperature released will be approximately 15 degrees centigrade which should not affect trout in the Lees Ferry Reach. As it flows downstream, more warming occurs but not to the range preferred by Humpback chub. The proposal would release water during summer and result in a temperature range preferred by Humpback chub for spawning and recruitment. All cooperators are involved with the compliance process. Native American tribes were represented at the TCD workshop held on July 1, 1998, and have already submitted comments on the EA.

Workshop Results: A TCD Workshop was held on July 1, 1998. Comments were received and will be included in the public document draft in the next few months.

Future Schedule of Activities: Planning goals are to develop a flexible plan that can learn and adapt to known and unknown adverse environmental impacts. Dave Trueman reviewed the structure construction and operations. Two-year construction is planned for years 2000-2001 at a cost of \$15 million. NEPA compliance is for construction and operation of the facility. EA and design work for 1997-1998: \$400,000; completion in 1999: \$600,000. There is a physical model of the intakes at USBR-Denver's lab. The construction will not be visible and should not affect structure integrity or the potential eligibility of GCD as a historic property. The 40-foot-high gates will be lifted with an onsite crane (which would take about a day to lift a gate) or individual automatic cable hoists (about 15 minutes). All gates will be at 3652 bottom elevation. No reservoir drawn down will be necessary during construction because the work can be accomplished by divers (less than 100 feet of water), or by remotely drilling holes. Operations effects are being investigated, and probably one unit will be down during construction. TCD modifications is a CRSP activity, the construction is authorized by CRSP, the O&M would be part of CRSP, so any O&M costs including the monitoring will be funded by power revenues either through the AMP process or other funding sources. The entire TCD monitoring program will be run through the AMP process, which manages resources below GCD and prioritizes the monitoring needs of all those resources. Construction costs are appropriated by Congress. EA and consultation work is funded by construction appropriations. Normal operations will be funded by power revenues. Additional monitoring costs related to the TCD for five years out are estimated at: FY2000 \$200,000 (for planning); FY 2001 \$1.1 million; FY2002: \$1.6 million; FY2003 \$1.6 million; FY2004 \$1.3 million; FY2005 \$550,000.

Dave Trueman indicated his view that GCMRC monitoring costs will have to be absorbed within the existing GCMRC budget or the budget will need to be increased. Additional data collection (inflow, etc.) may be requested by resource managers. Managers want to know the effects of high temperature water releases in conjunction with March/April/May low flows (approx. 8,000 cfs) will have on the aquatic food base. Caution will be exercised in the first releases. Temperature objectives will be set and consistent for a week or a month (not daily fluctuations unless programmed in), although a daily 1 degree variance will probably occur. The window of warm water releases spans from May to September/October (warmer water is available in May, but not 15 degree centigrade water). Dave Trueman will attempt to make his presentation available on the GCMRC AMWG/TWG web site.

CULTURAL RESOURCES

Ruth Lambert (GCMRC) reviewed cultural and recreational activities for FY98.

Programmatic Agreement: Scopes of work for FY98 projects were received from tribal and NPS units in August 1997. The USBR and GCMRC reviewed the projects, and they went through the GCMRC protocol and peer review process. Two NPS projects were funded. Four tribal proposals were received and one request for a no-cost extension to complete 1997 work. Two of these proposals were fully funded, two partially funded and one extension is under review.

GCMRC: The funded RFPs were: three cultural resource and one recreational project.

Cultural: A 1-year data synthesis of past info to assist GCMRC in formulating future projects. A two-year USGS project on flow impacts and related model sediment deposition that would benefit cultural resources. A two-year geomorphic modeling project which models geomorphic erosion relative to the location of cultural resources. Recreation: A University of Illinois project on recreational user preferences relative to flow releases.

GCMRC also received tribal proposals to conduct research and resource assessment on behalf of the GCMRC and the AMP. One funded project is an ethnobotanical project from the Hopi Tribe which will assess Hopi ethnobotanical resources and provide recommendations to GCMRC for future ethnobotanical monitoring. Two other proposals addressing ethnobotanical resources from other tribal perspectives are currently under review. A cultural session is scheduled for the TWG meeting in September to review products from these projects.

New Reclamation Archaeologist: Charles Calhoun introduced Nancy Coulam, the new UC USBR Regional Archaeologist (replacing Signa Larralde). Ms. Coulam will serve as the archaeological representative on the Compliance Team (referenced later in these minutes).

APRIL-MAY RELEASES

Clayton Palmer (WAPA) stated that on April 1, 1998, a low flow event occurred due to a Tri-

State Generation and Transmission Cooperative miscommunication about the correct time of a location changeover in WAPA's operating control. The generator reacted quickly to this as an emergency, and lowered power generation which in turn lowered GCD's flows. He explained the actual error in detail (the explanation is also contained in the TWG minutes of May 18-19, 1998.) Today's discussion stemmed from low flow events which occurred during high release months of April and May 1998 which were perceived as ROD daily fluctuations limitations violations. The low flows negatively impacted and re-set the aquatic food base. Mr. Palmer reviewed at length WAPA's role in power delivery and operating control of GCD. Dave Sabo acknowledged the violations and stated that WAPA is committed to operating under the law, utilizing the best conversion factors (megawatt hours to cubic feet per second) properly, and has modified its operations. For the near future, downramps will be scheduled at 1450 cfs instead of 1500 cfs to reduce the possibility of exceeding 1500 cfs. Maximum daily changes will be scheduled at 7,600 cfs rather than 8,000 cfs to reduce the possibility of going over 8,000 cfs as a maximum daily change. Other members of the AMWG reinforced the seriousness of the situation and its need to be remedied quickly. A suggestion was made to utilize other plants to offset an emergency rather than GCD. WAPA is not opposed to looking at different power generation locations to regulate. It is concerned about generating power and effects on resources downstream. It will address these concerns through the scientific adaptive management process. WAPA plans to work with the AMWG to ensure that studies are in place for GCMRC to identify adverse or beneficial effects of operations. WAPA will bring results to the AMWG and have the AMWG modify (if necessary) expectations of what the operation will do to the dam or modify the ROD. The USBR is the operator of the dam, and had previously expressed concern about the control switchover. Charley Calhoun reinforced that the USBR's objective is never to exceed the requirements of the ROD, and the USBR will refine its efforts to ensure that it does not happen again. The USBR will also increase its efforts to correct erroneous emergency signals it intercepts. It was suggested to share daily flow information with the river guides, and that has been placed on the USBR web site. Mr. Palmer is working on a system to advise river guides, fishermen, and other interested persons about anticipated changes in GCD operations. It was suggested that Mr. Palmer attend the annual river guides orientation meeting to facilitate communications.

Recommendation: On motion duly made, seconded and carried, WAPA will notify all AMWG and TWG official members, and other interested parties, by e-mail or fax, within 24 hours of the beginning of any emergency and each deviation from operating criteria (exceedence of upramp, downramp or daily maximum fluctuations).

BUDGET (Attachment 7)

Barry Gold reviewed the FY98 "Obligated Budget." A question was asked about funding a potential WY99 BHBF event. The TWG had previously discussed these funding issues and concluded that the GCMRC should request WAPA to assist with funding. Remote Sensing Technology expenses were spread over three years instead of one year. Some unfunded liabilities may occur if federal employees are given a raise. GCMRC was able to avoid anticipated repercussions of the annual Labor Day/low flow aerial photography flight and

instead conduct a remote sensed flight to gather data this year. A question arose about why remote sensing activities were implemented when it is on the agenda to be approved at this meeting. GCMRC made a management decision when an unanticipated opportunity presented itself. To cover the expense, some FY97 funds were reprogrammed, end of year cost efficiency surpluses utilized, FY98 adjustments made from aerial photography funds, logistics funds, and deferrals in capital expenses. The total reallocation was \$30,000, and the AMWG felt this was within GCMRC's management purview. This action is in alignment with requests from and future direction of other agencies to reduce impacts from physical intrusions into the Grand Canyon ecosystem.

Recommendation: After FY98 closes, GCMRC will provide an accounting on expended funds.

Approval of Formulation & Execution Protocol: (Attachment 9; 6/19/98 mailing)
Barry Gold explained "A Protocol for Out Year Program Planning and Cost Estimates in the AMP" (dated June 10, 1998). Annually in January and July the TWG reviews stakeholder management objectives and information needs. Between July and September GCMRC uses those to develop its Annual Plan and revise the Strategic Plan. From September to December the TWG reviews the Annual Plan and budget estimates for the out year. The out year program plans and costs will be sent to the AMWG for its January meeting and recommendation to the Secretary. A need was identified for a schedule to manage annual revisions, and "Protocols for Budget Implementation" (dated June 10, 1998) were developed. If Congress approves a lesser budget, the TWG and AMWG will evaluate options to accommodate the budget change and make a recommendation. If a new undertaking arises, monies will need to be redirected or new funding sources determined. These protocols were developed by the TWG and it respectfully requests the AMWG's approval.

Recommendation: A vote will not be taken today to approve the budget protocols (as shown on the agenda). Instead, the AMWG tasked the TWG to review the budget protocol document again at its meeting on July 23, 1998, and develop a more detailed and descriptive process for the overall AMP budget, for the AMWG, focusing not on the bottom line, but how and where money is applied on achieving the information needs and a method of reporting back on how much money is going into each Management Objective or Information Need. The TWG will then approve the revised protocols.

Approval of FY2000 Budget & New Initiatives: FY2000 is a "Proposed Budget" and although some numbers may shift between now and January as the TWG reviews it, the bottom line will not change. Based on management objectives and information needs, three budgets were presented to the Budget Ad Hoc Group of the TWG: 2000A \$7,191,000; 2000B \$7,996,000; 2000C \$9,356. The TWG recommended the 2000B \$7,996,000 budget. In September 1998 the GCMRC Program Managers will present the FY2000 Annual Plan to the TWG. The GCMRC funds KAS monitoring and research only, not recovery efforts.

Out-Year Plans: Barry Gold reviewed the detail of "FY99 Budgeted" estimates. GCMRC is building its long term plan. TCD monitoring is not included in the budget. It is developing

plans to adjust programs to take advantage of economies of scale and increase data collection and analyses efficiencies. To manage the workload generated from the broad base of stakeholder information needs, GCMRC will be finding ways to decrease monitoring costs so research efforts may be implemented. Funds turn over only when a particular research project ends and answers its research question. The GCMRC makes a distinction between parameters monitored annually to develop trend lines versus more research-related activities. Funding competition may exist for Biological Opinion work versus the long-term monitoring program. The Biological Opinion needs were integrated into the management objectives and information needs and prioritized highly. GCMRC staffing levels were questioned. The original concept for GCMRC was to move towards a smaller staff. GCES was reported to have had 28-30 staff (including contractors). GCMRC has 18-20 permanent and term FTEs (plus several students) to cover all programs and work requests for the TWG. The staffing plan has been provided to the TWG, and a need was identified to better articulate it to the AMWG. A suggestion was made to more fully detail, define and combine the two budget protocol documents, including how the budgets will be developed and how they relate to the Strategic and Annual Plans. The Strategic Plan is designed to incorporate the management objectives and prioritized information needs, step from the research and monitoring program to show how proposed activities relate to those objectives and information needs, and the attached budget will be aligned accordingly. The AMWG requested future budget information be distributed in a more timely manner. Logistics costs have been significantly reduced, but also the number of trips needs to be reduced. A question arose about approval of a \$7,996,000 budget when providing stakeholders' information needs would be enhanced by a larger budget. Charles Calhoun explained that the funding mechanism for this budget comes from power revenues and that ultimately power users' rates increase if the budget is increased. However, new projects with their attached budget requirements must always be considered (such as the TCD). He also referred to the message in the recent language from the U.S. Senate which admonishes against increasing the budget above FY98-99 levels. The matter was discussed and it was felt that the Senate issued a moratorium, but that any increases would have to be soundly justified. Steve Magnussen stated that the language is under consideration in terms of Administration responding back to the Congress. The USBR drafted language that is under consideration to be submitted to the committee that expresses concern about Congress establishing an arbitrary ceiling before the AMWG has completed its deliberations. USBR is recommending that they respond to the Congress, including the concern about potential negative impacts to this adaptive management process before any action is taken by the AMWG. The AMWG was reminded that report language is not law, and the Secretary still has to formulate his budget and make his recommendation ultimately to the President. If the budget is over \$7.2 million, clear justifications will be made. Also, the Secretary should be able to refer back to the fact that the AMWG body voted in support of the recommended budget.

Recommendation: Dr. Gold will prepare a full staffing plan for the AMWG's review and evaluation to determine if GCMRC staff resources need to be better defined and focused on its core responsibilities. Also, that the TWG address a concern that budget creep for staff not exceed the budget for program work in the future. Significant changes to the budget will have a supporting document explaining the change. The past/present/future budget template will

include the closed-out status of the past year when the information becomes available.

On motion duly made, seconded and carried, the AMWG approved the FY2000 \$7,271,000 budget, plus the remote sensing new initiative of \$400,000, plus the adjusted Lake Powell budget to be received from the TWG (according to the two motions which carried and are specified in the recommendations section of these minutes under the topic: "Lake Powell, Approval of 5-Year Plan"). *(Total: 14 In Favor/3 Opposed. Following discussion, 1 vote changed. New total 15 In Favor/2 Opposed.)* Minority Opinion: the minority opinion was that the TWG had recommended a budget of \$7.2 million and wanted consideration given to the new initiatives and they needed further discussion; that the new initiatives were not included in the budget recommended by the TWG; and that the Lake Powell initiative had been discussed and included some qualifiers, but there had not been adequate discussion of the remote sensing new initiative.

WRAP-UP

Action Items/Additional Assignments for TWG: Action items were reviewed, and are contained in the topic recommendations in these minutes.

Next Meeting Dates and Locations: The next meeting will be January 12-13, 1999, at a location to be arranged in north Phoenix, Arizona.

Possible Agenda Items for Next Meeting: No new items were presented.

Public Comment: The Chairman requested comments from the public at the end of major topics. Comments made are contained in the text of these minutes.

Adjourn: There being no further business, the Chairman adjourned the meeting at 3:13 p.m. on July 22, 1998.

Respectfully submitted,

Serena Mankiller, GCMRC Secretary